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BULLETIN

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Revision of the North American species of Encalypta

DOROTHY COKER

(WITH PLATES, 13 AND 14)

The family Encalyptaceae, of which there is only one genus, *Encalypta*, is closely related to the Pottiaceae, because of the twisted and crisped habit of its leaves when dry, the small, thick-walled, very papillose cells of the upper portion of the leaves, and the large hyaline cells at the base. The costa also is strong and often excurrent. The genus is noted for the great diversity in the structure of its peristome, ranging from double, with several remarkable variations, to single or absent.

Hedwig (**4**, p. 88), in 1782, based the genus *Leersia* on two species, *Bryum pulvinatum* and *B. extinctorium*, referring the latter to its Linnean synonym (see p. 103 in the descriptions of figures 19 and 24). Of these two species *Bryum pulvinatum*, which is a *Grimmia*, precedes *B. extinctorium;* and since *Grimmia*, according to Ehrhart (**6**, p. 176), antedates *Leersia* by one year, the name *Leersia* has been discarded. Hence, the adoption of the name *Encalypta* Schreb., 1791 (**9**, p. 759), instead of *Leersia* Hedw., 1782, is due to the fact that *Leersia*, which in reality antedates *Encalypta*, was originally used by Hedwig to include *Grimmia*. Subsequently Hedwig, in 1801 (**12**, pp. 60–63), accepted the name *Encalypta* in place of *Leersia*.

Following the older authors, Lesquereux and James (**32**, pp. 180–184) placed *Encalypta* under the Orthotrichaceae, and Schim-

[The BULLETIN for October (**45**: 391–432. *pl. 10–12*) was issued October 19, 1918.]

per (**28**, pp. 307–340) with the Grimmiaceae; Lindberg (**30**, p. 26) and Braithwaite (**33**, pp. 279–287) adopted *Leersia* for *Encalypta*, referring it, as a subfamily, to the Tortulaceae, because of the leaf-characteristics. Limpricht (**32**, pp. 102–123) and Dixon (**40**, pp. 227–231) agree in recognizing the Encalyptaceae as distinct from the Pottiaceae, but Dixon places it under the subgroup Aplolepideae and Limpricht uses the terms Haplolepideae and Diplolepideae only in the specific descriptions. Loeske (**48**, p. 100) rejects Lindberg's usage of *Leersia* under the Tortulaceae and also the placing by Brotherus (**44**, pp. 436–439) of the Encalypteae as a subfamily of the Pottiaceae, and agrees with Fleischer (**46**, p. xiii), who places them under a new group, the Heterolepideae, because the peristome varies from the Haplolepideae to the Diplolepideae, stating that they should be treated as a separate family.

In 1904 Paris Index (**45**, pp. 119–126) listed 30 species, of which 18 were recorded for North America. According to Brotherus, in 1902 (**44**, pp. 436–439), there were 35 species, of which 21 were recorded for the whole of America, 14 being endemic and 18 occurring north of Mexico. We* have reduced this number to 8 by careful comparison of original and authentic specimens and by studying the types whenever possible, having seen type specimens of *E. longipes*, *E. Macounii*, and *E. Selwyni* from the Austin and Mitten Herbaria, and authentic material of *E. alaskana*, *E. leiocarpa*, *E. subspathulata*, *E. cucullata*, *E. subbrevicolla*, and *E. labradorica* from the Macoun collections. The accompanying lists and synonymy show the changes that have been made. Only one species remains doubtful, *E. lacera* Ren. & Card. (**38**, p. 91); it was described in a footnote to their check list of North American mosses from specimens collected in Oregon by L. F. Henderson, and no specimens have been obtainable.

Chronological list of the North American species of Encalypta†

1753. *E. extinctoria* (L.) Sw. Disp. Musc. Suec. 24. 1799.
1782. *E. laciniata* (Hedw.) Lindb. Acta Soc. Sci. Fenn. **10**: 267. 1872.
1788. *E. contorta* (Wulf.) Lindb. Oefv. K. Vet. Akad. Foerh. **20**: 396. 1863.

* The responsibility for these reductions rests largely with Mrs. Britton.
† Adapted from Brotherus (**44**) and Paris Index (**45**).

1805. *E. alpina* Smith; Sowerby, Engl. Bot. *pl. 1419.* 1805.
1811. *E. rhabdocarpa* Schwaegr. Suppl. **1**: 56. *pl. 16.* 1811.
1827. *E. apophysata* Nees & Hornsch. Bryol. Germ. **2**: 49. *pl. 15, f. 5.* 1827.
1832. *E. procera* Bruch, Abh. Akad. München. **1**: 283. *pl. 11.* 1832.
1849. *E. mexicana* C. Müll. Syn. **1**: 516. 1849.
1865. *E. longipes* Mitt. Jour. Linn. Soc. **8**: 29. *pl. 5.* 1865.
1877. *E. Macouni* Aust. Bot. Gaz. **2**: 97. 1877.
1877. *E. Selwyni* Aust. Bot. Gaz. **2**: 109. 1877.
1889. *E. leiocarpa* Kindb. Bull. Torrey Club **17**: 275. 1889.
1892. *E. subspathulata* C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 93. 1892.
1892. *E. leiomitra* (Kindb.) Kindb.; Macoun, Cat. Can. Pl. 6: 94. 1892.
1892. *E. cucullata* C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 96. 1892.
1892. *E. alaskana* Kindb.; Macoun, Cat. Can. Pl. 6: 269. 1892.
1892. *E. lacera* Ren. & Card. Rev. Bryol. **19**: 91. 1892.
1897. *E. subbrevicolla* Kindb. Eur. & N. Am. Bryin. **2**: 295. 1897.
1897. *E. labradorica* Kindb. Eur. & N. Am. Bryin. **2**: 295. 1897.

Arrangement of the North American species of Encalypta*

§ 1. PYROMITRIUM (Wallr.) Kindb.

1. *E. alpina* Smith (*E. commutata* Nees & Hornsch.).

§ 2. XANTHOPUS Kindb.

2. *E. ciliata* (Hedw.) Hoffm. = *E. laciniata* (Hedw.) Lindb.
3. *E. Macounii* Aust. = *E. apophysata* Nees & Hornsch.
4. *E. alaskana* Kindb. = *E. laciniata.*

§ 3. RHABDOTHECA Kindb.

5. *E. vulgaris* (Hedw.) Hoffm. = *E. extinctoria* (L.) Sw.
6. *E. rhabdocarpa* Schwaegr. (including *E. leiomitra* Kindb.).
7. *E. lacera* Ren. & Card. = *E. rhabdocarpa*?
8. *E. subspathulata* C. Müll. & Kindb. = *E. rhabdocarpa.*
9. *E. mexicana* C. Müll. = *E. laciniata.*

* Adapted from Kindberg (**42**, pp. 292–297) and Brotherus (**44**, pp. 436–439).

§ 4. DIPLOLEPIS Kindb.

10. *E. longipes* Mitt. = *E. procera.*
11. *E. leiocarpa* Kindb. = *E. apophysata.*
12. *E. subbrevicolla* Kindb. = *E. brevicolla* Bruch.
13. *E. labradorica* Kindb. = *E. extinctoria.*

§ 5. STREPTOTHECA Kindb.

14. *E. contorta* (Wulf.) Lindb. (*E. streptocarpa* Hedw.).
15. *E. cucullata* C. Müll. & Kindb. = *E. procera* + *E. extinctoria.*
16. *E. procera* Bruch.
17. *E. Selwyni* Aust. = *E. procera.*

ENCALYPTA Schreb. Genera **2**: 759. 1791

Leersia Hedw. Fundam. **2**: 88, in part. 1782

Plants growing in dense compact cushions or mixed with other cespitose mosses; stems usually low and crowded, seldom more than 4 cm. high; branches usually simple and sub-apical, erect, the leaves uniformly spaced; leaves usually curled and twisted when dry, spreading above when moist, from an erect clasping oblong base, seldom more than 6 mm. long by 1.5 mm. broad; costa stout, either ending below the apex or excurrent into a subulate or mucronate point, cross-section of costa usually papillose above on both faces, with a large dorsal band of stereid cells and several upper layers of large ducts in 3–4 rows, the upper epidermal cells with thick walls and smaller papillae; cells of the upper part of the leaf-blade deeper than wide with clusters of prominent, minute papillae, those of the lower part of blade larger, oblong and usually without papillae, except in one species (*E. apophysata*) which has them on the short end walls; margins entire, flat or slightly recurved, rarely undulate. Perichaetial leaves generally smaller, more acuminate and often subulate.

Monoicous, or in one exception (*E. contorta*) dioicous; sometimes sterile and frequently propagating by elongated septate brood-bodies; the antheridia in small lateral axillary buds; archegonia terminal, vaginule enlarged, cylindric and often ochreate; seta usually elongate, smooth except in *E. streptocarpa*, seldom more than 1–2 cm., rarely 3 cm., long (*E. longipes*), usually twisted; calyptra large, 0.5–1 cm., completely covering the capsule to the base, cylindric and glossy, smooth or papillose at apex, sometimes slightly papillose over the entire surface, ragged or fringed at base; lid (operculum) large, never equalling the urn (theca), long-

rostrate; peristome originating at or below the mouth; simple (haplolepideous) or compound (diplolepideous), sometimes lacking; preperistome sometimes present; annulus simple or compound; teeth varying in length, usually papillose or striate, entire or split along the median line, rarely more or less united and attached to the endostome by a hyaline membrane, sometimes nodose or with short intermediate cilia; walls of the urn (theca) either smooth or striate, striae sometimes visible only after sporosis, sometimes spirally twisted or deeply grooved; neck (column) short, stomatose, or the stomata scattered along the wall; spores smooth or rough, usually maturing in spring or summer, variable in size.

Type species, *Bryum extinctorium* L.

The genus divides itself naturally into two groups or sections: § 1. *Haplolepideae*, with the peristome single or absent, and § 2. *Diplolepideae*, with the peristome double and variable.

In § 1 are included 4 species that are found in Europe and North America: *E. alpina*, *E. extinctoria*, *E. laciniata*, and *E. rhabdocarpa*, the last two approaching the *Diplolepideae* by having a preperistome.

In § 2 are included 4 species, also common to Europe and North America: *E. apophysata*, *E. brevicolla*, *E. procera*, and *E. contorta;* of these *E. contorta* has not yet been found fruiting on this continent.

Key to species

§ 1. HAPLOLEPIDEAE. Peristome simple or lacking; teeth, when present, short, lanceolate; capsule not twisted.
- Capsule striate, or becoming so when old.
  - Calyptra lacerate at base, nearly smooth at apex.
    - Peristome only occasionally found. Walls of cells at base of leaves thickened. — 1. *E. extinctoria.*
    - Peristome usually present, often with preperistome. Walls of cells at base of leaves not thickened. — 2. *E. rhabdocarpa.*
- Capsule smooth.
  - Calyptra lacerate at base but not fringed. Peristome never present, spores papillose. — 3. *E. alpina.*
  - Calyptra with a persistent or fugacious fringe of larger cells. Peristome usually present, deeply inserted. — 4. *E. laciniata.*

§ 2. DIPLOLEPIDEAE. Peristome double, teeth usually long and slender; endostome more or less adherent to the teeth.
- Capsule smooth, calyptra fringed or lacerate.
  - Teeth perforate or split along median line. Basal cells of leaves with short walls papillose. — 5. *E. apophysata.*

Teeth more or less united in pairs, unequal in length.
Basal cells of leaves not papillose. 6. *E. brevicolla.*
Capsule striate and spirally twisted, calyptra lacerate.
Monoicous, seta smooth, spores 15–25 μ; leaves slightly toothed at base. 7. *E. procera.*
Dioicous, seta slightly papillose, spores 8–12 μ, leaves entire. 8. *E. contorta.*

§ 1. Haplolepideae

1. ENCALYPTA EXTINCTORIA (L.) Sw. Disp. Musc. Suec. 24. 1799
Bryum extinctorium L. Sp. Pl. 1116. 1753.
Leersia extinctoria Hedw. Fundam. **2**: 88. 1782.
Leersia marginata Hedw. Fundam. **2**: 103. 1782.
Leersia vulgaris Hedw. Descr. **1**: 46. 1787.
Encalypta vulgaris Hoffm. Deuts. Fl. **2**: 27. 1796.
Encalypta cucullata C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 96, in part. 1892.
Encalypta extinctoria subsp. *tenella* Kindb.; Röll, Hedwigia **35**: 65. 1896.

Plants small, about 0.5–1 cm. high; leaves up to 4 mm. long, 1 mm. wide; apical blade lingulate, apex cucullate contracted to an abrupt point; costa ending below the apex, smooth on both faces except slightly toothed at tip on back; margins plane, erose above; papillose cells 12–14μ long; cells of hyaline base oblong, up to 55μ long by 15μ wide, walls brown, slightly thickened at ends, with 7–8 rows of long narrow cells at margin; perichaetial leaves shorter and blunt at apex, usually carinate when moist. Monoicous; vaginule about 1.5 mm. long; seta 5–8 mm., red brown, not twisted; calyptra entire or ragged at base, slightly papillose at apex; lid about 1.5 mm. long; capsule 2–3 mm. long by 1 mm. wide, cylindric, smooth when young, ribbed when old; annulus simple, narrow; mouth marked by an irregular, broken row of 1–2 quadrate, small, thickened cells; urn with the stomata sparsely scattered over the entire surface; neck short, red, without stomata; peristome, when present, of simple fugacious teeth; spores rough with large rounded papillae, 24–32μ, maturing in early spring.

TYPE LOCALITY: European.

DISTRIBUTION: On rocks and earth in the Rocky Mountains, from British Columbia to Colorado, and South Dakota; western states from Nevada to California. Also Eurasia and Australasia, according to Paris Index (**45**).

ILLUSTRATIONS: Dill. Hist. Musc. *pl. 45. f.* 8. 1741 (as *Bryum*); Hedw. Descr. **1**: *pl. 18.* 1787 (as *Leersia*); Bryol. Eur. *pl. 199.* 1838 (as *E. vulgaris*).

EXSICCATAE: Macoun, Can. Musci *491* (as *E. cucullata*); Holz. Musci Acro. Bor. Am. *214*. 1906.

1a. ENCALYPTA EXTINCTORIA APICULATA Wahl. Fl. Lapp. 344. 1812

Costa usually excurrent into a short hair-point; capsule when mature striate and somewhat ribbed.

DISTRIBUTION: Colorado, Montana, and Assiniboia. Also Europe.

1b. ENCALYPTA EXTINCTORIA MUTICA Brid. Musc. Recent. Suppl. 4: 28. 1819

Costa disappearing far below the blunt apex; mature capsule ribbed.

DISTRIBUTION: Colorado to British Columbia. Also Europe.

2. ENCALYPTA RHABDOCARPA Schwaegr. Suppl. 1: 56. 1811

Leersia rhabdocarpa Lindb. Musci Scand. 26. 1879.

Encalypta rhabdocarpa var. *leiomitra* Kindb. Ottawa Nat. 4: 61. 1890.

Encalypta subspathulata C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 93. 1892.

Encalypta leiomitra Kindb.; Macoun, Cat. Can. Pl. 6: 94. 1892.

Plants 1.5–2 cm. high; leaves 3–4 mm. by 0.66–1 mm. wide, lingulate, flat and spreading when moist; costa extending beyond the suddenly contracted apex of leaf into a long mucronate hair-point or ending below the apex, papillose on back below the middle and on the upper surface above the middle of the leaf; margin plane; papillose cells, hexagonal, diameter 15–20μ; cells of hyaline base, irregular, not papillose, 24–48μ long by 24μ wide; walls orange, not thickened, with a distinct marginal border of 6–8 rows of cells, 60μ long by 6–10μ wide; perichaetial leaves smaller and tapering to a hair-point. Monoicous; seta 6–8 mm., orange, not twisted; calyptra entire or ragged at base, papillose at apex and sometimes to about the middle; lid about 2 mm.; capsule 2–3 mm. long by 1 mm. wide, cylindric, striate, each ridge of about 5–6 rows of cells; annulus simple; rim of the mouth marked by 2–3 rows of small brown quadrate cells; stomata numerous, scattered throughout the entire surface of the urn; neck short, red, deeply wrinkled with large loose cells; peristome usually present, single, of 16 red, finely striate, papillose teeth, with 4–5 segments, and occasionally with a narrow lateral preperistome covering 1–2 segments at base of the teeth; spores 40–50μ in diameter, very rough with large granular warts, ripe in late spring.

According to Limpricht (**39**, p. 115. *f. 245, 246*) there is great variation in the peristomes of this species. However, we have not found any peristome to correspond with his *f. 246* in American specimens.

TYPE LOCALITY: European.

DISTRIBUTION: Arctic America, Greenland, Labrador to Quebec and northern New York, Rocky Mountains from Montana to New Mexico, Pacific Coast ranges from Washington to California. Also Europe and Asia.

ILLUSTRATIONS: Schwaegr. Suppl. 1: *pl. 16.* 1811; Bryol. Eur. *pl. 205.* 1838.

EXSICCATAE: Drummond, Musci Am. *50, 51* in part; also *52.* 1828. Sull. & Lesq. Musci Bor. Am. *112.* 1856; ed. 2. *166.* 1865; Macoun, Can. Musci *131, 421* (as *E. subspathulata*).

E. leiomitra differs from *E. rhabdocarpa* only in that the apex of the calyptra is nearly smooth.

E. subspathulata is undoubtedly *E. rhabdocarpa*, but all of the older capsules are badly infected by fungi and filled with hyphae.

2a. ENCALYPTA RHABDOCARPA PILIFERA (Funck) Nees & Hornsch. Bryol. Germ. **2**: 41. 1827

Encalypta pilifera Funck, in Sturm, Deuts. Fl. 17: *pl. 5.* 1819.
Leersia extinctoria var. *pilifera* Lindb. Musc. Scand. 20. 1879.

Leaves somewhat broader and more ovate; costa excurrent into a long toothed hair; peristome perfect.

DISTRIBUTION: Fraser River Valley, Canada. Also Europe.

ILLUSTRATION: Sturm, Deuts. Fl. 17: *pl. 5.*

2b. ENCALYPTA RHABDOCARPA MICROSTOMA Breidler; Limpr. Laubm. **2**: 115. 1895

Capsule narrowing to a small mouth. Lid small, extended into a long point; peristome perfect or rudimentary. A parallel form to *E. laciniata microstoma.*

DISTRIBUTION: Alpine regions of the Rocky Mountains. Also Europe.

3. ENCALYPTA ALPINA Smith; Sowerby, Engl. Bot. *pl. 1419.* 1 F 1805

Encalypta affinis Hedw. f. Weber & Mohr's Beitr. 1: 121. Mr 1805.

Encalypta commutata Nees & Hornsch. Bryol. Germ. **2**: 46. 1827.
Leersia alpina Lindb. Musci Scand. 20. 1879.

Plants 4–6 cm. high; leaves 3–4 mm. by 1 mm. subspatulate, carinate; apex cucullate when moist; costa excurrent into a long hair-point or ending below the apex, smooth except for a few teeth just below the apex of leaf; margin plane; upper cells hexagonal, 12μ–16μ, not densely papillose; cells of hyaline base 32μ–48μ long by 16μ wide, walls not thickened, becoming narrower and longer toward the margin; perichaetial leaves smaller and tapering to a long hair point. Monoicous; vaginule about 1 mm. long; seta 7–9 mm. long, orange, seldom twisted; calyptra laciniate at base, very slightly papillose at apex; lid 1.5 mm. long; annulus of 2–3 rows of cells; capsule 2–3 mm. long by 0.75 mm. wide, cylindric, smooth when young, appearing striate when old; mouth marked by 1–2 rows of small red-brown quadrate cells often irregularly broken; neck short, wrinkled, stomatose; peristome none; spores 25μ–35μ, warty, often flattened and irregular, ripe in late summer.

TYPE LOCALITY: European.

DISTRIBUTION: Alpine regions of the Rocky Mountains from Colorado to Washington; Alaska and Greenland. Also Europe and Asia.

ILLUSTRATIONS: Sowerby, Engl. Bot. *pl. 1419*. 1805; Weber & Mohr's Beitr. **1**: *pl. 4*. 1805; Schwaegr. Suppl. **1**: *pl. 16*. 1811 (as *E. affinis*); Bryol. Eur. *pl. 198*. 1838.

EXSICCATAE: Drummond, Musci Am. *49*. 1828 (as *E. affinis*).

4. ENCALYPTA LACINIATA (Hedw.) Lindb. Acta Soc. Sc. Fenn. **10**: 267. 1872

Bryum extinctorium var. β. L. Sp. Pl. 1116. 1753 (see Dillen, **1**, p. 349; also Druce & Vines, **47**, p. 210).
Leersia laciniata Hedw. Fundam. **2**: 103. *pl. 5, f. 24a*. 1782.
Leersia ciliata Hedw. Descr. **1**: 49. 1787.
Encalypta ciliata Hoffm. Deuts. Fl. **2**: 27. 1796.
Encalypta mexicana C. Müll. Syn. **1**: 516. 1849.
Encalypta alaskana Kindb.; Macoun, Cat. Can. Pl. 6: 269. 1892.

Plants growing on wet limestone rocks; about 1–3 cm. high; leaves carinate when moist, up to 5 mm. long, to about 1.3 mm. wide; apical blade elliptic or lingulate, suddenly contracted to a short mucronate point; costa thick, tapering into the short finely serrulate tip or ending below the apex, slightly toothed on

the back; margins revolute below the middle, above entire or erose with truncate, minutely papillose cells up to 13–24μ in diameter; cells of the hyaline base not papillose, oblong, up to 60μ long by 13–21μ wide, becoming narrower toward the margin, the basal cells with brown walls; perichætial leaves slightly smaller. Monoicous; seta yellow to brown, 5–10 mm. high; calyptra broadening at base into a deep regular fringe of larger cells, smooth or slightly roughened at apex; lid beaked, up to 2 mm. long; annulus present, of one row of cuneate cells; capsule 3–5 mm. long by 1 mm. wide, cylindric, smooth; mouth narrow bordered by 3–5 rows of smaller thickened cells; urn with numerous large stomata from the middle to the neck; peristome deeply inserted, single; teeth lanceolate with 5–7 joints, which are longitudinally papillose inside and occasionally with a darker colored preperistome partially covering the basal segments; spores up to 37μ in diameter, with radiating stellate lines, maturing in summer.

TYPE LOCALITY: European.

DISTRIBUTION: Alpine and mountain regions; Eastern States from Maine to northern New York; North Central States from Michigan to Wisconsin, Minnesota; Rocky Mountains from Montana to New Mexico; west coast from Washington to California; British America from Ontario to British Columbia. Also Europe, Asia, Africa and Australia.

ILLUSTRATIONS: Dill. Hist. Musc. *pl. 45. f. 9.* 1741; Hedw, Descr. 1. *pl. 19.* 1787; Bryol. Eur. *pl. 200.* 1838.

EXSICCATAE: Drummond. Musci Am. *50.* 1828; Sull. & Lesq. Musci Bor. Am. *111.* 1856; ed. 2. *165.* 1865; Austin, Musci Ap. *174.* 1870; Macoun, Can. Musci *132* (as *E. ciliata*), and *133* (as *E. Macounii*); Allen, Mosses of Cascade Mts. Wash. *45*; Holz. Musci Acro. Bor. Am. *213.* 1906; Pringle, Plantae Mexicanae *10547* (as *E. mexicana*).

4*a*. **Encalypta laciniata microstoma** (Schimp.) comb. nov.

Encalypta ciliata var. *microstoma* Schimp. Coroll. Bryol. Eur. 38. 1855.

Seta only 3–6 mm. high; calyptra with brown fringe; capsule narrowing to a small mouth. Neck somewhat longer and running down into the seta; peristome smaller, irregular, often lacking; spores very finely papillose, less transparent, and the radiating lines less distinct; ripe in August.

DISTRIBUTION: Northern New York and in the alpine regions of the Rocky Mountains. Also Europe and Asia.

Diplolepideae

5. ENCALYPTA APOPHYSATA Nees & Hornsch. Bryol. Germ. **2**: 49. 1827

Encalypta Macounii Aust. Bot. Gaz. **2**: 97. 1877.
Encalypta leiocarpa Kindb. Bull. Torrey Club **17**: 273. 1890.

Plants 1.5–2 cm. high; leaves 3–4 mm. long by 1 mm. wide, carinate, lingulate; costa ending in the blunt apex or rarely excurrent into a short mucronate point, densely papillose on both surfaces with coarse spinose teeth on dorsal apex; margins revolute above; cells of upper blade 8–10μ, irregular, those of the hyaline base 50–60μ long by 8–10μ wide with the end walls thickened, with papillose projections; perichaetial leaves slightly broader. Monoicous. Seta 10–12 mm. long, smooth; calyptra 6–7 mm. long by 1 mm. wide, very scabrous at apex, papillose over the entire surface, basal fringe sometimes fugacious, cells of fringe narrow; lid about 2 mm. high; capsule 2–3 mm. long by 0.5 mm. wide, not striate, neck apophysate when dry or when wet long and tapering; annulus of 2–3 rows of cells, more or less persistent; mouth bordered by 3–4 rows of small thick-walled hexagonal cells; peristome obscurely double; teeth slender, very papillose, perforate, rarely bifid, inner peristome white, papillose, adhering closely and almost invisibly to the outer; spores 18–24μ, finely papillose, maturing in summer.

TYPE LOCALITY: European.

DISTRIBUTION: Rocky Mountains of British Columbia to Montana; and (according to Paris Index) Scoresby Straits, Arctic America. Also Europe and Asia.

ILLUSTRATIONS: Bryol. Eur. *pl. 201*. 1838; Limpricht, Laubm. **2**: *f. 247*. 1891.

EXSICCATAE: None. Drummond, Musci Am. *50*, is *E. laciniata;* so are many of the specimens cited in Macoun's Catalogue (**37**) for *E. Macounii*. The American specimens of this species seem to have the leaves more often blunt than is usual in the European ones, though Limpricht (**39**) describes them as *obtuse* or *short-pointed*. The type specimens of *E. Macounii* in Austin's herbarium are immature and no spores were formed, but in all other characters they agree with *E. apophysata*. The description of *E. leiocarpa* is erroneous in two important characters, for the calyptra is fringed and the peristome is double.

6. ENCALYPTA BREVICOLLA (B. S. G.) Bruch; C. Müll. Syn. 1: 519. 1849

Encalypta longicolla var. *brevicolla* B. S. G. Bryol. Eur. (4:) Encalypta 12. 1838.

Encalypta labradorica Kindb. Eur. & N. Am. Bryin. 2: 295. 1897.

Encalypta subbrevicolla Kindb. Eur. & N. Am. Bryin 2: 295. 1897.

Plants 1–1.5 cm. high; leaves 4–5 mm. long by 1 mm. wide, subacuminate, carinate; costa excurrent into long colorless hair-point, sometimes toothed at the base of awn, papillose on both surfaces; margins plane; upper cells of blade 12–16μ in diameter, irregular; those at the hyaline base 40–48μ long by about 16μ wide, becoming narrower and colorless at the smooth margins; walls orange-colored, slightly thickened at ends; perichaetial leaves slightly shorter and broader. Monoicous; seta 1 cm. long, smooth, red; calyptra 5 mm. long by 1 mm. wide, very scabrous at the apex, papillose over the entire surface, lacerate at base; lid 2–2.25 mm. high, with a red border; capsule about 3 mm. long by 1 mm. wide, not striate; neck short, stomatose, with large basal cells; annulus none; mouth bordered by 4–5 rows of small, thick-walled, quadrate cells; peristome double, deeply inserted; teeth .8 mm. high, irregularly broken and branched, usually united in pairs at base and perforate above, papillose; inner peristome similar and attached to the outer, median segments longer than the lateral ones; spores 28–32μ, very rough.

TYPE LOCALITY: European.

DISTRIBUTION: Labrador and, according to Paris Index, the eastern coast of Greenland. Also Europe.

ILLUSTRATIONS: Bryol. Eur. *pl. 202, β.* 1838.

EXSICCATAE: None.

7. ENCALYPTA PROCERA Bruch, Abh. Akad. Münch. 1: 283. 1832

Encalypta longipes Mitt. Jour. Linn. Soc. 8: 29. 1865.

Encalypta Selwyni Aust. Bot. Gaz. 2: 109. 1877.

Leersia procera Lindb. Musci Scand. 20. 1879.

Leersia Selwyni E. G. Britton, Bull. Torrey Club 18: 50. 1891.

Encalypta cucullata C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 96, in part. 1892.

Plants 2–4 cm. high; leaves more or less spreading when dry, 5–6 mm. long by 1 mm. wide; apical blade subspathulate, apex blunt; costa ending below apex, papillose on upper surface, scabrous on back; margin revolute above; upper cells 12–16μ in diameter, round; those of the hyaline base, 48–60μ long by 12–16μ wide;

walls deep orange, thickened at ends, basal margin slightly serrate; with 3–4 rows of narrow cells, walls colorless and ends unthickened; perichaetial leaves acuminate, tapering, with the costa percurrent into a long hair-point. Monoicous; seta about 1.5–2 cm., smooth, purple shading to orange above; calyptra 6–7 mm. long by 1.5 mm. wide, papillose at apex, very slightly so over the entire surface, lacerate at base but without differentiation of cells; lid 2 mm., marked by ragged broken cells at base; capsule 3–4 mm. long by 0.4 mm. wide, cylindric, slightly striate when young, marked when old by 8 striae, spirally twisted once or twice around the capsule; annulus large, compound; mouth bordered by 2 rows of small thick-walled quadrate cells; neck short, stomatose; peristome double, teeth about 0.5 mm. long, narrow, red, smooth or papillose, basal segments of teeth united and perforated; endostome papillose, orange, as long as the teeth, attached to a papillose basal membrane, the segments alternating with short cilia; spores 15–25μ, smooth, granular inside.

TYPE LOCALITY: European.

DISTRIBUTION: On earth in crevices of rocks and on banks; Ontario to British Columbia and Alaska; the Rocky Mountains of Idaho and Montana; Greenland. Also northern Europe and Asia.

ILLUSTRATIONS: Abh. Akad. Münch. **1**: *pl. 2*. 1832; Bryol. Eur. *pl. 205*. 1838; Mitt. Jour. Linn. Soc. **8**: *pl. 5*. 1865 (as *E. longipes*).

EXSICCATAE: Drummond, Musci Am. *48*. 1828 (as *E. streptocarpa*); Macoun, Can. Musci *134* (as *E. Selwyni*), 474 (as *E. longipes*), *491* in part (as *E. cucullata*), and *565* (as *E. procera*).

8. ENCALYPTA CONTORTA (Wulf.) Lindb. Oefv. Sv. Vet.-Akad. Förh. **20**: 396. 1863

Bryum contortum Wulf.; Jacq. Coll. **2**: 236. 1788.

Encalypta streptocarpa Hedw. Sp. Musc. 62. 1801.

Leersia contorta Lindb. Musci Scand. 19. 1879.

Plants 2–4 cm. high; leaves spreading when dry, 5–6 mm. long by 1.5 mm. wide; apical blade lingulate, carinate; apex tapering to the blunt point; costa ending below the apex, very papillose on both surfaces, scabrous on back at basal portion; margins plane; upper cells 12–16μ in diameter, round, those of the hyaline base, 40–48μ long by 16μ wide, not papillose; walls deep orange, slightly thickened at angles, basal margins bordered by 2–3 rows

of long narrow cells; perichaetial leaves 2–3 mm., more acuminate. Dioicous. Seta about 1.5–2 cm. long, slightly papillose, purple; calyptra 8–10 mm. long by 1 mm. wide, brown, lacerate at base, very rough at apex, entire surface slightly papillose; lid 1.5 mm. long; capsule 4–5 mm. by 2–3 mm. wide, larger at base, deeply grooved with 8 striae, which are spirally twisted 2–3 times around the capsule; annulus large, compound, persistent; mouth bordered by 2–3 rows of small thick-walled quadrate cells; neck short, stomatose, red; peristome double; teeth long, narrow, orange-colored, very papillose; endostome with 32 paler papillose segments, one half the length of teeth, united at base by a thin papillose membrane; spores 8–12μ, smooth, irregular, ripe in early summer.

TYPE LOCALITY: European.

DISTRIBUTION: On limestone rock, sand and earth in temperate and alpine regions of Canada and Ontario to the Rocky Mountains; Eastern States from Vermont to Virginia; Central States from Ohio to Minnesota; Colorado and California, according to Paris Index. Also Europe and Asia. Fruit plentiful in Europe but not yet found in North America.

ILLUSTRATIONS: Hedw. Sp. Musc. *pl. 10.* 1801 (as *Encalypta streptocarpa*); Bryol. Eur. *pl. 204.* 1838.

EXSICCATAE: Sull. Musci Allegh. *152.* 1845; Aust. Musci App. *175.* 1870; Macoun, Can. Musci *135;* Holz. Musci Acro. Bor. Am. *141.* 1904.

I would like to acknowledge my appreciation of the assistance and unfailing interest given by Mrs. N. L. Britton, without which this work could not have been done. I am also indebted to the officers of the New York Botanical Garden for help and the use of the Library and the Herbarium, and to Professor J. M. Macoun, of the Department of Mines, Geological Survey, Ottawa, Canada, for the loan of the Macoun collections of *Encalypta*, containing the types and co-types of Kindberg and Müller.

COLUMBIA UNIVERSITY.

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Description of plates 13 and 14

PLATE 13

A. ENCALYPTA EXTINCTORIA (L.) Sw. 1. Plant, natural size. 2. Single plant, enlarged. 3. Various forms of leaves. 4. Base of leaf showing hyaline cells with border. 5. Apex of leaf showing smaller papillose cells. 6. Capsule enlarged. 7. Calyptra with rough apex. 8. Rough spores.

B. ENCALYPTA RHABDOCARPA Schwaegr. 1. Plants, about natural size. 2. Forms of leaves. 3. Smooth basal cells. 4. Apical papillose cells. 5. Ribbed capsule. 6. Calyptra with rough apex. 7. Peristome showing basal preperistome. 8. Rough spores.

C. ENCALYPTA ALPINA Smith. 1. Plants, natural size. 2. Forms of leaves. 3. Basal cells. 4. Apex with subulate awn. 5. Capsule. 6. Calyptra. 7. Portion of capsule walls showing ragged rim of mouth and one stoma. 8. Rough spores.

D. ENCALYPTA LACINIATA (Hedw.) Lindb. 1. Plants, about natural size. 2. Leaves. 3. Basal cells and border. 4. Apex with mucronate point. 5. Capsule. 6. Fringed calyptra. 7. Basal portion enlarged. 8. Rough peristome, and rim of capsule. 9. Smooth, stellate spores.

PLATE 14

A. ENCALYPTA APOPHYSATA Nees & Hornsch. 1. Plants, natural size. 2. Leaves. 3. Basal cells, with papillose transverse walls. 4. Apical cells. 5. Capsule. 6. Papillose calyptra. 7. Base of same, fringed. 8. Double peristome, the inner more or less attached to the outer. 9. Rough spores.

B. ENCALYPTA BREVICOLLA Bruch. 1. Plants. 2. Leaves. 3. Cells of base. 4. Cells of apex. 5. Capsule. 6. Papillose calyptra. 7. Double papillose peristome, the inner more or less branched. 8. Rough spore.

C. ENCALYPTA PROCERA Bruch. 1. Plant. 2. Stem and perichaetial leaves. 3. Smooth basal cells. 4. Papillose apical cells. 5. Twisted capsule. 6. Papillose ragged calyptra. 7. Double peristome, the inner perforate at base. 8. Fragment of annulus. 9. Smooth spores.

D. ENCALYPTA CONTORTA (Wulf.) Lindb. 1. Plants. 2. Leaf. 3. Basal cells. 4. Apical cells. 5. Twisted capsule. 6. Papillose and ragged calyptra. 7. Double peristome more or less united with intermediate cilia. 8. Smooth spores.

Philippine Basidiomycetes—III

PAUL W. GRAFF*

(WITH PLATE 15)

A large number of basidiomycetous fungi have been added from time to time to those known from the Philippine Islands and, as opportunity has offered, numerous tropical species described by different botanists have been checked. The result is that, with the extension of our knowledge, many ranges have been extended, and not a few supposedly distinct species have proven to be identical. The confusion of names has, to a considerable extent, been due to a failure to compare authentically named specimens from the larger museums and herbaria and to a slight and possibly unconscious tendency to limit species distribution with geographic boundaries. A brief review of the synonymy in the following pages, in company with a comparison of named specimens, will show the value of a comparative study of species from various localities, and the need for a continuation of such studies. Extensive studies should also be made of material from Japan, Formosa, China, the Malay States, Borneo, Java, Celebes, New Guinea and Australia. This would bring to light many interesting facts regarding little-known species. Likewise, a comparative study of material from these localities with fungi collected in other more distant and less related tropical countries would probably broaden many views regarding the localization of fungal distribution. For example, *Auricularia mesenterica* (Dicks.) Fr. is also of common occurrence in the American tropics and southern Europe; *Corticium caeruleum* (Schrad.) Fr. is found in North America, southern Europe and northern Africa; and *Pleurotus flabellatus* Berk. & Br. has been collected in tropical America, Ceylon, and South Africa, as well as in the Philippines.

The material in the following list of fungi was collected on the islands of Luzon, Mindoro, Polillo, Leyte, Negros, Culion, and

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Mindanao. All of the collections cited are preserved in the herbarium of the Bureau of Science, Manila. The preceding parts of this series have been published in the Philippine Journal of Science (**8**: Bot. 299–307. 1913; **9**: Bot. 235–254. 1914).

USTILAGINEAE

USTILAGO Persoon

USTILAGO ANDROPOGONIS-ACICULATI Petch, Ann. Roy. Bot. Gard. Perad. **4**: 303. 1909.

LUZON: Manila, May, 1910, *Merrill 7070*, on *Andropogon aciculatus* Retz.

Originally described from material collected on the same host at Peradeniya, Ceylon.

USTILAGO EMODENSIS Berk. Jour. Bot. & Kew Gard. Misc. **3**: 202. 1851.

LUZON: Subprovince of Benguet, December, 1906, *Mearns*, on *Polygonum chinense* L.

Described from material in Hooker's Sikkim-Himalayan collection from Tonglo, at an elevation of 3,300 m. The species is closely related to *U. Candollei*.

USTILAGO KOORDERSIANA Bref. Unters. Mykol. **12**: 132. *pl. 8, f. 5, 6*. 1895.

NEGROS: Cabacalan, March, 1910, *Merrill 6766*, on *Polygonum barbatum* L.

Originally described on the same host from Java.

USTILAGO PANICI MILIACEI (Pers.) Wint.; Rabenhorst, Krypt.-Fl. **1**[1]: 89. 1884.

Uredo (*Ustilago*) *segetum* var. *Panici miliacei* Pers. Syn. Fung. 224. 1801.

Uredo carbo var. *Panici miliacei* DC. Fl. Franç. **6**: 76. 1815.

Caeoma destruens Schlecht. Fl. Berol. **2**: 130. 1824.

Uredo destruens Duby, Bot. Gall. ed. 2. **2**: 901. 1830.

Erysibe Panicorum Wallr. Fl. Crypt. Germ. **2**: 216. 1833.

Ustilago carbo var. *destruens* Tul. Ann. Sci. Nat. Bot. III. **7**: 81. 1847.

Tilletia destruens Lév. Ann. Sci. Nat. Bot. III. **8**: 372. 1848.

Ustilago destruens Schlecht.; Rabenhorst, Herb. Myc. Nov. *400*.

MINDANAO: District of Cotobato, Cotobato, May 8, 1904, *E. B. Copeland, Bur. Sci. 1349*, on *Panicum* sp.

Previously reported from North and South America and southern Europe. Probably of very general distribution.

USTILAGO TONKINENSIS (P. Henn.) Sacc. Syll. Fung. **11**: 232. 1895.

Uredo tonkinensis P. Henn. Hedwigia **34**: 11. 1895.

LUZON: Province of Rizal, Caloocan, November 20, 1909, *C. B. Robinson, Bur. Sci. 9554*, on *Ischaemum aristatum* var. *gibbum*.

Collected previously in the vicinity of Hanöi, French Indo-China, parasitic on *Andropogon* sp.

CINTRACTIA Cornu

CINTRACTIA LEUCODERMA (Berk.) P. Henn. Hedwigia **34**: 335. 1895.

Ustilago leucoderma Berk. Ann. Mag. Nat. Hist. II. **9**: 200. 1852.

Cintractia Krugiana Magn. Bot. Jahrb. **17**: 490. 1893.

Cintractia affinis Peck, N. Y. State Mus. Bull. **67**: 28. 1903.

MINDANAO: District of Davao, Lake Lanao, Camp Keithley, September, 1907, *Mary S. Clemens*, on *Rynchospora glauca* Vahl; District of Zamboanga, November–December, 1911, *Merrill 8322*, on *Rynchospora aurea* Vahl.

Reported from the southern portion of the United States, the West Indies, Mexico, Brazil, and Borneo.

USTILAGINOIDEA Brefeld

USTILAGINOIDEA VIRENS (Cooke) Tak. Bot. Mag. Tokyo **10**: 19. 1896.

Ustilago virens Cooke, Grevillea **7**: 15. 1878.

Ustilaginoidea Oryzae Bref. Unters. Mykol. **12**: 194. 1895.

Tilletia Oryzae Pat. Bull. Soc. Myc. Fr. **13**: 124. 1897.

LUZON: vicinity of Manila, *P. W. Graff;* Province of Laguna, Santa Rosa, December, 1912, *P. W. Graff*, on *Oryza sativa* L.

This fungus is a common parasite on rice and is found in most

of the rice-growing districts of India, Japan, the Philippines, and Malaya.

PUCCINEAE

HAMASPORA Koernicke

HAMASPORA ACUTISSIMA Syd. Monogr. Ured. **3**: 80. 1912.

LUZON: Province of Benguet, Pauai, June, 1909, *R. C. McGregor, Bur. Sci. 8510a*, at an altitude of about 2,100 m.; Province of Tayabas, Mount Banjao, March, 1907, *F. W. Foxworthy, Bur. Sci. 2399a*. NEGROS: Canlaon Volcano, April, 1910, *Merrill 222a*. The host plant of the three collections is *Rubus Rolfei* Vidal.

The species has also been reported on *Rubus moluccanus* L., collected in Java and Australia.

PUCCINIA Persoon

PUCCINIA HYPTIDIS (M. A. Curt.) Tracy & Earle, Bull. Miss. Agr. Exp. Sta. 34: 86. 1895.

Uredo Hyptidis M. A. Curt. Amer. Jour. Sci. **2**: 6. 1820.

Uredo Ciberti Speg. Anal. Soc. Cien. Arg. **9**: 15. 1880.

Puccinia Ciberti Speg. Anal. Mus. Nat. Buenos Aires II. **6**: 220. 1899.

Aecidium Hyptidis P. Henn. Hedwigia **34**: 337. 1895.

Aecidium tucumanense Speg. Anal. Mus. Nat. Buenos Aires III. **9**: 35. 1908.

MINDANAO: District of Davao, Davao, March 21, 1904, *Copeland 595*, on *Hyptis spicigera* Lam. (*Uredo* stage).

Previously collected in the southern portion of the United States and the tropical and temperate portions of South America.

PHRAGMIDIUM Link

PHRAGMIDIUM SUBCORTICIUM (Schrank) Wint.; Rabenhorst, Krypt.-Fl. **1**[1]: 228. 1881.

Lycoperdon subcorticium Schrank, Bot. Tasch. Hoppe 68. 1793.

Uredo miniata var. *Eglanteriae* Pers. Syn. Fung. 216. 1801.

Uredo elevata Schum. Enum. Pl. Sael. **2**: 229. 1803.

Aecidium Rosae Röhling, Deuts. Fl. ed. 2. **3**: 122. 1813.

Uredo Eglanteriae H. Mart. Fl. Mosq. ed. 2. 230. 1817.

Caeoma miniatum Schlecht. Fl. Berol. **2**: 120. 1824.
Caeoma Rosae var. *miniatum* Link; Willd. Sp. Pl. 6^2: 30. 1825.
Erysibe miniata var. *Rosarum* Wallr. Fl. Crypt. Germ. **2**: 200. 1833.
Coleosporium miniatum Bon. Gatt. Coniom. 60, in part. 1860.
Phragmidium Rosarum f. *R. pimpinellifoliae* Rabenh. Fungi Eur. *1671* (hyponym). 1873.
Phragmidium Rosae pimpinellifoliae Diet. Hedwigia **44**: 339. 1905.
Caeoma exitiosum Syd. Ured. 1700 (hyponym). 1913.

LUZON: Subprovince of Benguet, Baguio, June 10, 1913, *J. C. Wagner, Bur. Sci. 21002.*

This species is of wide distribution, having been reported from North America, Europe, Africa and Australia. It is probable that the fungus was introduced into the Philippines with either European or American cultivated rose stock.

AURICULAREAE

AURICULARIA Bulliard

AURICULARIA LOBATA Sommerf.; Fries, Elench. Fung. **2**: 34. 1828.

LUZON: Province of Rizal, Antipolo, October, 1912, *M. Ramos, Bur. Sci. S76.*

Previously collected on the River Niger, Africa.

AURICULARIA MESENTERICA (Dicks.) Fr. Epicr. Myc. 555. 1838.
Helvella mesenterica Dicks. Plant. Crypt. **1**: 20. 1785.
Auricularia tremelloides Bull. Hist. Champ. Fr. 278. *pl. 290.* 1791–1798.
Auricularia violacea Bull. Hist. Champ. Fr. 278. 1791–1798
Thelephora mesenterica Pers. Syn. Fung. 571. 1808.
Thelephora purpurea Pers. Syn. Fung. 571. 1808.
Auricularia corrugata Sowerb. Engl. Fungi *pl. 290.* 1797–1815.
Auricularia ornata Pers.; Gaudichaud, Bot. Voy. Uranie 177. *pl. 2, f. 4.* 1826.
Phlebia mesenterica Fr. Elench. Fung. **1**: 154. 1828.
Oncomyces mesentericus Klotz. Linnaea **7**: 195. 1832.

LUZON: Province of Rizal, January 16, 1906, *F. W. Foxworthy, Bur. Sci. 121;* same locality, February, 1911, *M. Ramos, Bur. Sci*

12552. MINDANAO: District of Davao, Davao, April, 1904, *Copeland "F."*

Of common occurrence in the American and European tropics.

AURICULARIA RUGOSISSIMA (Lév.) Bres. Hedwigia **53**: 78. 1912.
Phlebia rugosissima Lév. Ann. Sci. Nat. Bot. III. **2**: 214. 1844.
Phlebia reflexa Berk. Jour. Bot. & Kew Gard. Misc. **3**: 16. 1851.

MINDORO: Mount Halcon, November, 1905, *Merrill 6118.* NEGROS: Gimagaan River, January, 1904, *Copeland 25.*

Previously collected in the West Indies and northern India.

HIRNEOLA Fries

HIRNEOLA AFFINIS (Jungh.) Bres. Annal. Myc. **8**: 587. 1910.
Merulius affinis Jungh. Fl. Crypt. Java 76. 1838.
Laschia velutina Lév. Ann. Sci. Nat. Bot. III. **2**: 217. 1844.

LUZON: Province of Laguna, Mount Maquiling, February, 1912, *P. W. Graff, Bur. Sci. 15934.*

Originally described from material collected in Java. This fungus has also been reported from Japan.

HIRNEOLA AMPLA (Pers.) Fr. Fungi Nat. 26. 1848.
Auricularia ampla Pers.; Gaudichaud, Bot. Voy. Uranie 77. 1826.
Exidia nobilis Lév. Ann. Sci. Nat. Bot. III. **2**: 218. 1844.
Exidia ampla Lév. Ann. Sci. Nat. Bot. III. **5**: 159. 1846.
Hirneola nobilis Fr. Fungi Nat. 26. 1848.

LUZON: vicinity of Manila, February, 1904, *Copeland 41*, on *Gliricidia maculata* H.B.K. NEGROS: Gimagaan River, January, 1904, *Copeland 30*, on *Dipterocarpus* sp.

Reported previously from Japan and Natal.

HIRNEOLA AURICULA-JUDAE (Fr.) Berk. Outl. Brit. Fung. 289. 1860; Fr. Hym. Eur. 695. 1874.
Tremella auricula L. Sp. Pl. 1157. 1753.
Merulius auricula Roth, Tent. Flor. Germ. **1**: 535. 1788.
Peziza auricula L. Syst. Veg. ed. 13. 1018. 1789.
Tremella auriformis Hoffm. Veg. Crypt. **2**: 31. *pl. 6, f. 4.* 1790.
Tremella caragana Pers. Syn. Met. Fung. 625. 1808.

Auricularia sambucina Mart. Fl. Crypt. Erlang. 459. 1817.

Exidia auricula-judae Fr. Syst. Myc. **2**: 221. 1822.

Auricularia auricula Underw. Mem. Torrey Club **12**: 15. 1902.

LUZON: Province of Rizal, Bosoboso, July, 1906, *M. Ramos, Bur. Sci. 1185*, on *Gliricidia maculata*.

Reported from southern Europe, Guiana, Japan, and the East Indies.

HIRNEOLA TENUIS (Lév.) Fr. Fungi Nat. 27. 1848.

Exidia tenuis Lév. Ann. Sci. Nat. Bot. III. **2**: 219. 1844.

LUZON: Province of Isabela, Cordon, May 8, 1909, *M. Ramos, Bur. Sci. 8135*.

Previously collected in Natal, Borneo and Brazil.

THELEPHOREAE

CORTICIUM Persoon

CORTICIUM CAERULEUM (Schrad.) Fr. Epicr. Myc. 562. 1838.

Thelephora caerulea Schrad. Spicil. Fl. Germ. 187. 1794.

Thelephora fimbriata Roth, Catal. Bot. **2**. *pl. 9, f. 2*. 1800.

Auricularia phosphorea Sowerb. Engl. Fungi *pl. 350*. 1797–1815.

Thelephora indigo Schwein. Schr. Nat. Ges. Leipzig **1**: 107. 1822.

Merisma fimbriata Schwein. Schr. Nat. Ges. Leipzig **1**: 110. 1822.

Thelephora atro-caerulea Trog, Flora **15**: 560. 1832.

MINDORO: Mount Halcon, November, 1906, *Merrill 5545*, on decaying tree branches, host plant undetermined.

Previously collected in North America, southern Europe and northern Africa.

HYMENOCHAETE Léveillé

HYMENOCHAETE ADUSTA (Lév.) Bres. Hedwigia **51**: 323. 1912.

Stereum adustum Lév. Ann. Sci. Nat. Bot. III. **2**: 213. 1844.

Thelephora adusta Lév.; Gaudichaud, Bot. Voy. Bonite 192. *pl. 139, f. 2*. 1846.

MINDANAO: District of Davao, Mount Apo, May, 1909, *Elmer 10607*.

Originally described from material collected in the vicinity

of Manila by Gaudichaud-Beaupré, on the occasion of the visit of the French vessel "Bonite" to that port, and deposited in the herbarium of the Museum of Paris.

HYMENOCHAETE CACAO Berk. Jour. Linn. Soc. Bot. **10**: 333. 1869.

Stereum cacao Berk. Jour. Bot. & Kew Gard. Misc. **6**: 169. 1854.

LUZON: Subprovince of Ifugao, Payauan, January 26, 1913, *R. C. McGregor, Bur. Sci. 20038;* Province of Nueva Ecija, Cabanatuan, September, 1908, *R. C. McGregor, Bur. Sci. 5250;* Province of Bataan, November, 1909, *H. M. Curran, For. Bur. 19209.* MINDANAO: District of Davao, March, 1904, *Copeland 495, 523;* District of Zamboanga, Zamboanga, January, 1908, *Whitford & Hutchinson, For. Bur. 9269, 9296.*

This species is of very general tropical distribution.

HYMENOCHAETE NIGRICANS (Lév.) Pat. Bull. Soc. Myc. France **23**: 75. 1907.

Thelephora nigricans Lév. Ann. Sci. Nat. Bot. III. **2**: 212. 1844.

Stereum nigricans Sacc. Syll. Fung. **6**: 561. 1888.

NEGROS: Province of Negros Oriental, Dumaguete, April, 1908, *Elmer 9851.*

Previously reported from Cochin China.

HYMENOCHAETE RHEICOLOR (Mont.) Lév. Ann. Sci. Nat. Bot. III. **5**: 211. 1846.

Stereum rheicolor Mont. Ann. Sci. Nat. Bot. II. **17**: 23. 1842.

LUZON: Province of Laguna, Mount Maquiling, February, 1912, *P. W. Graff, Bur. Sci. 15948.*

Collected previously in the East Indies and French Guiana.

HYMENOCHAETE TENUISSIMA Berk. Jour. Linn. Soc. Bot. **10**: 333. 1869.

Stereum tenuissimum Berk. Jour. Bot. **6**: 510. 1847.

LUZON: Province of Tayabas, Lucban, May, 1907, *Elmer 7548.*

Previously reported from the island of Ceylon.

STEREUM Persoon

STEREUM BELLUM Kunze, Flora **13**: 370. 1830.

MINDANAO: District of Davao, Todaya, April 26, 1904, *Copeland 1294,* on a decaying log.

Previously collected in the Madeira Islands.

STEREUM CONCOLOR Berk. Hook. Flor. Tasm. 259. 1860. Not *Stereum concolor* (Jungh) Sacc., 1888.

LUZON: Province of Tayabas, Lucban, May, 1907, *Elmer 8166*, on dead and decaying branches.

Described from material collected in Tasmania.

STEREUM CRENATUM Lév. Ann. Sci. Nat. Bot. III. **2**: 210. 1844.

MINDANAO: District of Zamboanga, San Ramon, May, 1904, *Copeland 763*, on a root clump of living *Cocos nucifera* L.

Previously collected in the island of Java.

STEREUM INVOLUTUM Klotz. Linnaea **7**: 499. 1832.

NEGROS: Province of Negros Occidental, Mount Canlaon, September, 1909, *H. M. Curran*, *For. Bur. 13738*. MINDANAO: District of Davao, Davao, April, 1904, *Copeland 1294*.

Previously collected in Mauritius.

STEREUM LUGUBRE Cooke, Grevillea **12**: 85. 1884.

LUZON: Province of Rizal, Bosoboso, July, 1906, *M. Ramos, Bur. Sci. 1203*. LEYTE: Dagami Panda, September 5, 1913, *Wenzel 3*.

Collected previously in New Zealand.

STEREUM OSTREA (Bl. & Nees) Fr. Epicr. Myc. 547. 1838.

Thelephora ostrea Bl. & Nees, Fung. Java 13. *pl. 2, f. 1*. 1826.

LUZON: Province of Benguet, Pauai, June, 1909, *R. C. McGregor, Bur. Sci. 8709*, at an altitude of 2,100 m.

Found in Malacca and Java, and probably distributed throughout Malaya in general.

STEREUM OSTREA var. CONCOLOR (Jungh.) Bres. Hedwigia **53**: 76. 1912.

Thelephora concolor Jungh. Fung. Java 38. 1826.

Thelephora lobata Kunze, Linnaea **5**: 527. 1830.

Stereum lobatum Fr. Epicr. Myc. 547. 1838.

Stereum perlatum Berk. Lond. Jour. Bot. **1**: 153. 1842.

Stereum concolor Sacc. Syll. Fung. **6**: 561. 1888. Not *Stereum concolor* Berk., 1860.

LUZON: Province of Rizal, Bosoboso, July, 1906, *M. Ramos, Bur. Sci 1210;* Palawan, Mount Pulgar, May, 1911, *Elmer 13057.* MINDANAO: District of Davao, Mount Apo, May, 1909, *Elmer 10556.*

This appears to be a case where the variety is much more widely known than the species. It is certainly much the commoner in the Philippines. While the species, so far as is at present known, seems to be quite rare in the Islands, the variety is one of the most common of this group of plants. The three collections enumerated above indicate range rather than prevalence. Berkeley's species, *Stereum perlatum*, was originally described from Philippine material.

Reported from the West Indies, Guiana, Brazil, Cochin China, Sumatra, and generally throughout the East Indies.

STEREUM PRINCEPS (Jungh.) Lév. Ann. Sci. Nat. Bot. III. **2**: 210. 1844.

Thelephora princeps Jungh. Fl. Crypt. Java 39. 1838.

Stereum scytale Berk. Jour. Bot. & Kew Gard. Misc. **6**: 170. 1854.

Stereum contrarium Berk. Jour. Linn. Soc. Bot. **16**: 52. 1878.

POLILLO: October–November, 1909, *R. C. McGregor, Bur. Sci. 10547.* MINDANAO: District of Davao, Mount Apo, June, 1909, *Elmer 11006.*

Collected previously in Cuba, Brazil, Japan, Java, and northern India.

STEREUM SPECTABILE Klotz.; Meyen, Nov. Act. Acad. Nat. Cur. **19**: Suppl. 1. 238. *pl. 5, f. 2.* 1843.

Stereum radiato-fissum Berk. & Br. Trans. Linn. Soc. II. **2**: 63. *pl. 14, f. 8–11.* 1883.

Stereum luzoniense Ricker, Philip. Jour. Sci. **1**: Suppl. 283. 1906.

LUZON: Province of Bataan, summit of Mount Mariveles, on prostrate logs, October, 1903, *Merrill 3531* (type of *Stereum luzoniense*); Province of Laguna, Calauan, December 7, 1910, *R. C. McGregor, Bur. Sci. 12520.*

Ricker's species must be combined with *Stereum spectabile*, as a synonym, the two proving, on a careful comparison of the type

material of *Stereum luzoniense* with authentically named specimens of the former, to be identical.

Besides being found in the Philippines, this species has been reported from Australia and Mauritius.

CLADODERRIS Persoon

CLADODERRIS ELEGANS (Jungh.) Fr. Fung. Nat. 21. 1848.

Cymatoderma elegans Jungh. Ann. Sci. Nat. Bot. II. **16**: 320. 1841.

LUZON: Province of Rizal, Bosoboso, July, 1906, *M. Ramos, Bur. Sci. 1189.* MINDANAO: Subprovince of Butuan, March–July, 1911, *Weber 1283.*

This species shows a considerable tendency toward a transition into *Cladoderris infundibuliformis.* So far, however, not enough comparative material has been obtained to enable one to state definitely whether this is a general condition or that the few specimens showing the similarity are exceptional.

Collected previously in South Africa and the East Indies.

CLADODERRIS INFUNDIBULIFORMIS (Klotz.) Fr. Fung. Nat. 21. 1848.

Actinostroma infundibuliformis Klotz.; Meyen, Nov. Act. Acad. Nat. Cur. **19**: Suppl. 1. 237. 1843.

Cladoderris Blumei Lév. Ann. Sci. Nat. Bot. III. **2**: 213. 1844.

Cladoderris Decandolleana Lév. Ann. Sci. Nat. Bot. III. **2**: 214. 1844.

LUZON: Province of Rizal, Bosoboso, July, 1906, *M. Ramos, Bur. Sci. 1184.*

Cladoderris Blumei Lév., described from Javan material in Blume's herbarium and Philippine material in Delessert's herbarium, should unquestionably be placed as a synonym of *C. infundibuliformis.*

Collected previously by Meyen, between 1830 and 1832, in the vicinity of Manila. The fungus has been also collected in Java, South Africa, and Brazil.

HYMENOLICHENES

CORA Fries

CORA GYROLOPHIA Fr. Epicr. Myc. 556. 1838.

Gyrolophium aeruginosum Kunze; Krombh. Consp. Fung. *pl. 5, f. 16.* 1821.

LEYTE: Dagami Panda, September 8, 1913, *Wenzel 5*, growing in the moist forest at an altitude of 60 m., on tree ferns.

Previously collected in Mauritius.

CORA PAVONIA (Web. & Mohr) Fr. Epicr. Myc. 556. 1838.

Thelephora pavonia Web. & Mohr, Beitr. Naturk. 1: 326. 1805.

LUZON: Province of Benguet, vicinity of Baguio, May, 1911, *C. B. Robinson, Bur. Sci. 14107.*

Collected previously in the West Indies and other parts of the American tropics.

CLAVARIEAE

LACHNOCLADIUM Léveillé

LACHNOCLADIUM FLAGELLIFORME (Berk.) Cooke, Austr. Fungi 179. 1892.

Clavaria flagelliformis Berk.; Hooker, Fl. New Zeal. 186. 1855.

MINDANAO: District of Davao, Mount Apo, May, 1909, *Elmer 11301.*

Described from material collected in New Zealand. As yet reported only from these Pacific regions.

LACHNOCLADIUM USAMBARENSE P. Henn. Bot. Jahrb. 29: 44. 1904.

MINDORO: Bulalacao, August–September, 1906, *Bermejos, Bur. Sci. 1553.*

Previously known only from East Africa.

PHYSALACRIA Peck

PHYSALACRIA ORINOCENSIS Pat. Bull. Soc. Myc. Fr. 1: 41. *pl. 13, f. 2.* 1884.

LUZON: vicinity of Manila, October, 1912, *Merrill*, on decaying bamboo stalks.

This interesting little species of "Bubble Cap" has also been collected by the writer in Manila, where it was growing in profusion on bamboo joints which were being used for flower pots. Being used for seedling plants and cuttings, these pots were kept constantly moist and in a shady place so that they formed an ideal substratum for a fungal growth.

Collected previously in tropical America.

HYDNEAE

IRPEX Fries

IRPEX FLAVUS Klotz. Linnaea **8**: 488. 1833.

Polyporus flavus Jungh. Flor. Crypt. Java 46. 1838.

NEGROS: Gimagaan River, January, 1904, *Copeland 26*, on decaying wood.

Coriolopsis melleoflavus Murr. (Bull. Torrey Club **35**: 393. 1908) is not a synonym for this species as stated by Bresadola (Hedwigia **53**: 75. 1912) but belongs rather among the numerous synonyms of *Polystictus cervino-gilvus* (Jungh.) Fr. For this arrangement see Graff (Philip. Jour. Sci. **9**: Bot. 239. 1914).

Collected in North America, Java, and the East Indies. When further known the species will, in all probability, be found to grow in the American tropics as well.

POLYPOREAE

POLYPORUS (Micheli) Fries

POLYPORUS ADUSTUS (Willd.) Fr. Syst. Myc. **1**: 363. 1821.

Boletus adustus Willd. Fl. Berol. Prod. 392. 1787.

Polyporus carpineus Sowerb. Engl. Fungi *pl. 231*. 1799.

Polyporus crispus Fr. Obs. Myc. **1**: 127. 1815.

Polyporus pallescens Fr. Syst. Myc. **1**: 369. 1821.

Boletus isabellinus Schw. Schr. Nat. Ges. Leipzig **1**: 96. 1822.

Polyporus subcinereus Berk. Ann. Mag. Nat. Hist. II. **3**: 391. 1839.

Polyporus Halesiae Berk. & Curt. Ann. Mag. Nat. Hist. II. **12**: 434. 1853.

Polyporus Lindheimeri Berk. & Curt. Grevillea **1**: 50. 1872.

Bjerkandera adusta Karst. Medd. Soc. F. et Fl. Fenn. **5**: 38. 1879.

Myriadoporus adustus Peck, Bull. Torrey Club **11**: 27. 1884.

Polyporus Burtii Peck, Bull. Torrey Club **24**: 146. 1897.

MINDANAO: District of Davao, Mount Apo, April 20, 1904, *Copeland 1075;* Lake Lanao, Camp Keithley, July, 1907, *Mary S. Clemens*.

A fungus of very general distribution.

POLYPORUS ATYPUS Lév. Ann. Sci. Nat. Bot. III. **2**: 184. 1844.

Trametes aurora Ces. Myc. Borneo 5. 1879.

Coriolus atypus Pat. Tax. Hymén. 94. 1900.

Polystictus atypus Bres. & Syd. Philip. Jour. Sci. **9**: Bot. 348. 1914.

MINDORO: Puerto Galera, June, 1912, *P. W. Graff, Bur. Sci. 530*, growing on dead branches.

Previously collected in Java and Borneo.

POLYPORUS BENGUETENSIS (Murr.) Graff, Philip. Jour. Sci. **9**: Bot. 236. 1914. [PLATE 15, FIG. 1].

Coltricia benguetensis Murr. Bull. Torrey Club **35**: 391. 1908.

Polystictus benguetensis Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 321. 1912.

LUZON: Province of Benguet, Baguio, October–November, 1905, *Merrill 5003* (type of *Coltricia benguetensis* Murr.); same locality, March, 1904, *Elmer 6047*—both collections from prostrate logs of *Pinus insularis* Endl.

Upper surface and pore layer of the same shade of brown and quite distinct in color from the flesh of the pileus which is a shining golden yellow-brown when broken. The characteristics are so distinct that its place in the genus *Polyporus* cannot be questioned.

As yet, only collected in the Philippines.

POLYPORUS LUZONENSIS (Murr.) Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 266. 1912.

Spongipellis luzonensis Murr. Bull. Torrey Club **34**: 473. 1907.

LUZON: Province of Bataan, Mount Mariveles, November, 1904, *Elmer 6944*, on dead wood.

Described from Philippine material and, so far, not reported from elsewhere.

FOMES Fries

FOMES ALBOMARGINATUS (Lév.) Sacc. Syll. Fung. **6**: 185. 1888.

Polyporus albomarginatus Lév. Ann. Sci. Nat. Bot. III. **2**: 191. 1844.

Polyporus kermes Berk. & Br. Jour. Linn. Soc. Bot. **14**: 49. 1875.

Polyporus laeticolor Berk. Jour. Linn. Soc. Bot. **16**: 46. 1878.

Fomes pyrrhocreas Cooke, Grevillea **14**: 11. 1885.

Polyporus ochrocroceus P. Henn. Monsunia **1**: 145. 1899.

Pyropolyporus albomarginatus Murr. Bull. Torrey Club **34**: 478. 1907.

MINDANAO: District of Davao, Mount Apo, April 20, 1904, *Copeland 1077*, growing on a fallen log in the forest.

Collected previously in Ceylon, Java, and New Guinea.

FOMES FULLAGERI Berk. Jour. Linn. Soc. Bot. **16**: 54. 1878.

NEGROS: Province of Negros Occidental, Farar, October 8, 1909, *H. M. Curran, For. Bur. 17476*, growing on living *Shorea* sp.

According to the collector's note, the fungus sporophore was growing from a wound, and the fungus had caused a rotting of the heartwood of the tree. The rot is not accompanied by any staining of the wood. It is possible that this fungus may be found to be one of the important timber destroyers of the Philippine Islands.

This fungus has been previously collected in Australia.

FOMES MELANOPORUS (Mont.) Sacc. Syll. Fung. **6**: 196. 1888.

Polyporus melanoporus Mont.; Ramon de la Sagra. Hist. Phys. Polit. Nat. Cuba **9**: 422. 1841.

Polyporus cinereo-fuscus Curt. Trans. Linn. Soc. II. **1**: 124. *pl. 19, f. 1.* 1876.

Fomes melanoporoides Ces. Myc. Borneo 6. 1879.

Fomes cornu-bovis Cooke, Grevillea **13**: 2. 1884.

Nigrofomes melanoporus Murr. Bull. Torrey Club **31**: 425. 1904.

LUZON: Province of Bataan, Mount Mariveles, November, 1904, *Elmer 6959*.

Reported from Cuba, Borneo, Malacca and India.

FOMES MERRILLII (Murr.) Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 287. 1912.

Pyropolyporus Merrillii Murr. Bull. Torrey Club **34**: 479. 1907.

CULION: December, 1902, *Merrill 3575*, on decaying tree trunks near the seashore.

As yet reported only from the Philippines.

FOMES ROSEUS (Alb. & Schw.) Cooke, Grevillea **14**: 21. 1885.

Boletus roseus Alb. & Schw. Consp. Fung. 251. 1805.

Polyporus roseus Fr. Syst. Myc. **1**: 372. 1821.

Polyporus carneus Nees, Nov. Act. Acad. Nat. Cur. **13**: 14. *pl. 3*. 1827.

Polyporus rufo-pallidus Trog, Flora **15**: 556. 1832.

Fomitopsis rosea Karst. Rev. Myc. **3**: 18. 1881.

Fomes carneus Cooke, Grevillea **14**: 21. 1885.

LUZON: Province of Laguna, Mount Maquiling, April, 1913, *P. W. Graff, Bur. Sci. 21042*, on a prostrate log near the trail at an altitude of 150 m.

Previously collected in North, Central and South America, Europe, Australia and Java. In the Americas its habitat is confined to the tropical and warmer temperate portions. In all probability Africa will be added to this list in the course of time and the species will be found to be of universally tropical distribution.

POLYSTICTUS Fries

POLYSTICTUS ABIETINUS (Dicks.) Fr. Syst. Myc. **1**: 370. 1821.

Boletus abietinus Dicks. Plant. Crypt. Brit. **3**: 21. *pl. 9, f. 9*. 1793.

Polyporus incarnatus Schum. Enum. Plant. Saell. **2**: 391. 1803.

Sistotrema violaceum Pers. Syn. Fung. 551. 1808.

Polyporus dolosus Pers. Myc. Eur. **2**: 77. 1828.

Coriolus abietinus Quél. Enchir. Fung. 175. 1886.

LUZON: Bontoc Subprovince, February–March, 1911, *Vanoverbergh 1117*, on the bark of *Pinus insularis* Endl.

Found in northern North America, Cuba and Europe.

POLYSTICTUS PERPUSILLUS (Murr.) Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 319. 1912.

Coriolus perpusillus Murr. Bull. Torrey Club **35**: 396. 1908.

MINDANAO: District of Davao, Lake Lanao, Camp Keithley. July, 1907, *Mary S. Clemens*.

Reported only from the Philippines.

POLYSTICTUS RUBRITINCTUS (Murr.) Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 320. 1912.

Coriolus rubritinctus Murr. Bull. Torrey Club **35**: 396. 1908.

MINDORO: Mount Halcon, November, 1906, *Merrill 6117*.

As yet collected only in the Philippines.

POLYSTICTUS TABACINUS Mont.; Gay, Hist. Fisica Pol. Chili **7**: 361. *pl. 7, f. 6.* 1845.

Polyporus tabacinus Mont. Ann. Sci. Nat. Bot. II. **3**: 349. 1835.

Polyporus spadiceus Jungh. Flor. Crypt. Java 54. *pl. 30.* 1838. Not *P. spadiceus* Berk.

Polystictus microcyclus Zipp.; Léveillé, Ann. Sci. Nat. Bot. III. **2**: 188. 1844.

Polystictus spadiceus Fr. Nov. Symb. Myc. 1851.

Polystictus xerampelinus Kalchbr. Grevillea **4**: 72. 1876.

Cycloporellus microcyclus Murr. Bull. Torrey Club **34**: 468. 1907.

Polystictus substygius Bres. Hedwigia **53**: 66. 1912.

Cyclomyces spadiceus Pat. Philip. Jour. Sci. **10**: Bot. 95. 1915.

Cyclomyces tabacinus Pat. Philip. Jour. Sci. **10**: Bot. 95. 1915.

LUZON: Province of Laguna, Mount Maquiling, February, 1912, *P.W. Graff, Bur. Sci. 15956, 15981.*

Originally described from material collected in Juan Fernandez, later from material collected in Chili, New Zealand and Java.

POLYSTICTUS TABACINUS var. **barbatus** (Murr.) comb. nov. [PLATE 15, FIG. 2.]

Cycloporellus barbatus Murr. Bull. Torrey Club **35**: 397. 1908.

Polystictus barbatus Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 321. 1912.

Polystictus spadiceus var. *barbatus* Graff, Philip. Jour. Sci. **9**: Bot. 242. 1914.

LUZON: Province of Zambales, November–December, 1907, *H. M. Curran & M. L. Merrit, For. Bur. 8208* (type of *Cycloporellus barbatus* Murr.).

As yet this variety has only been collected in the Philippine Islands.

POLYSTICTUS TABACINUS var. **substygius** (Berk. & Br.) comb. nov.

Fomes substygius Berk. & Br.; Cooke, Praec. Polyp. *522.*

Fomes spadiceus var. *halconensia* Bres. Hedwigia **53**: 59. 1912.

LUZON: Province of Rizal, February, 1911, *M. Ramos, Bur. Sci. 13467;* Mindoro, Mount Halcon, November, 1906, *Merrill 6114* (var. type).

There are two varieties of *Polystictus tabacinus*, which represent two different sorts of development and variation from the type. The first variety, *barbatus*, does not vary in pilear texture but in the fact that the upper surface is covered with a long tomentum, and has a somewhat darker shade of color. This tomentum varies in length from short, at the outer margin, to about 3 mm., near the place of attachment of the fungus.

In the case of the second variety, *substygius*, the variation is one of which insufficient notice has been taken; namely, a tendency toward the assumption of a perennial development in an occasional species, which is typically annual, when growing under the warm conditions of a tropical climate. This second variety has developed in this manner. The context of the plant develops much thicker and harder than normally. The upper surface loses its characteristic velvety tomentum, becoming hard and smooth. Otherwise than this the plant retains its usual characters. To one unfamiliar with the variations through which this plant may pass the natural tendency would be to place it in the genus *Fomes*. While pore layers have been occasionally observed in this variety they are the exception rather than the rule.

Fomes spadiceus (Berk.) Cooke is not this species, but a quite distinct plant.

Reported from Samoa, the Philippines, Malacca, and the East Indies.

TRAMETES Fries

TRAMETES ELMERI (Murr.) Graff, Philip. Jour. Sci. **9**: Bot. 243. 1914.

Tyromyces Elmeri Murr. Bull. Torrey Club **34**: 475. 1907.

Polyporus Elmeri Sacc. & Trott.; Saccardo, Syll. Fung. **21**: 279. 1912.

LUZON: Province of Bataan, Mount Mariveles, November, 1904, *Elmer 6954*, on dead wood.

The generic characters of this fungus are those of *Trametes* rather than *Polyporus*. Saccardo evidently made the change on general principles rather than after a critical study of the species.

As yet collected only in the Philippines.

TRAMETES INSULARIS Murr. Bull. Torrey Club **35**: 405. 1908.

LUZON: Province of Benguet, Baguio, April, 1909, *R. C. McGregor, Bur. Sci. 8311*, on *Pinus insularis* Endl.

The limited distribution of pines makes this fungus very local in the Islands. As this is but the second collection which has been made to date, this form must be rare even in the pine regions.

Not reported outside the Philippine Islands.

UNIVERSITY OF MONTANA,
MISSOULA, MONTANA

Explanation of plate 15

FIG. 1. *Polyporus benguetensis* (Murr.) Graff. Specimen from the herbarium of the Bureau of Science, Manila, *Merrill 5003*, co-type material of *Coltricia benguetensis* Murr.

FIG. 2. *Polystictus tabacinus* var. *barbatus* (Murr.) Graff. Specimen from the herbarium of the Bureau of Science, Manila, *Curran & Merritt, For. Bur. 8208* co-type of *Cycloporellus barbatus* Murr.

INDEX TO AMERICAN BOTANICAL LITERATURE

1914–1918

The aim of this Index is to include all current botanical literature written by Americans, published in America, or based upon American material; the word America being used in the broadest sense.

Reviews, and papers that relate exclusively to forestry, agriculture, horticulture, manufactured products of vegetable origin, or laboratory methods are not included, and no attempt is made to index the literature of bacteriology. An occasional exception is made in favor of some paper appearing in an American periodical which is devoted wholly to botany. Reprints are not mentioned unless they differ from the original in some important particular. If users of the Index will call the attention of the editor to errors or omissions, their kindness will be appreciated.

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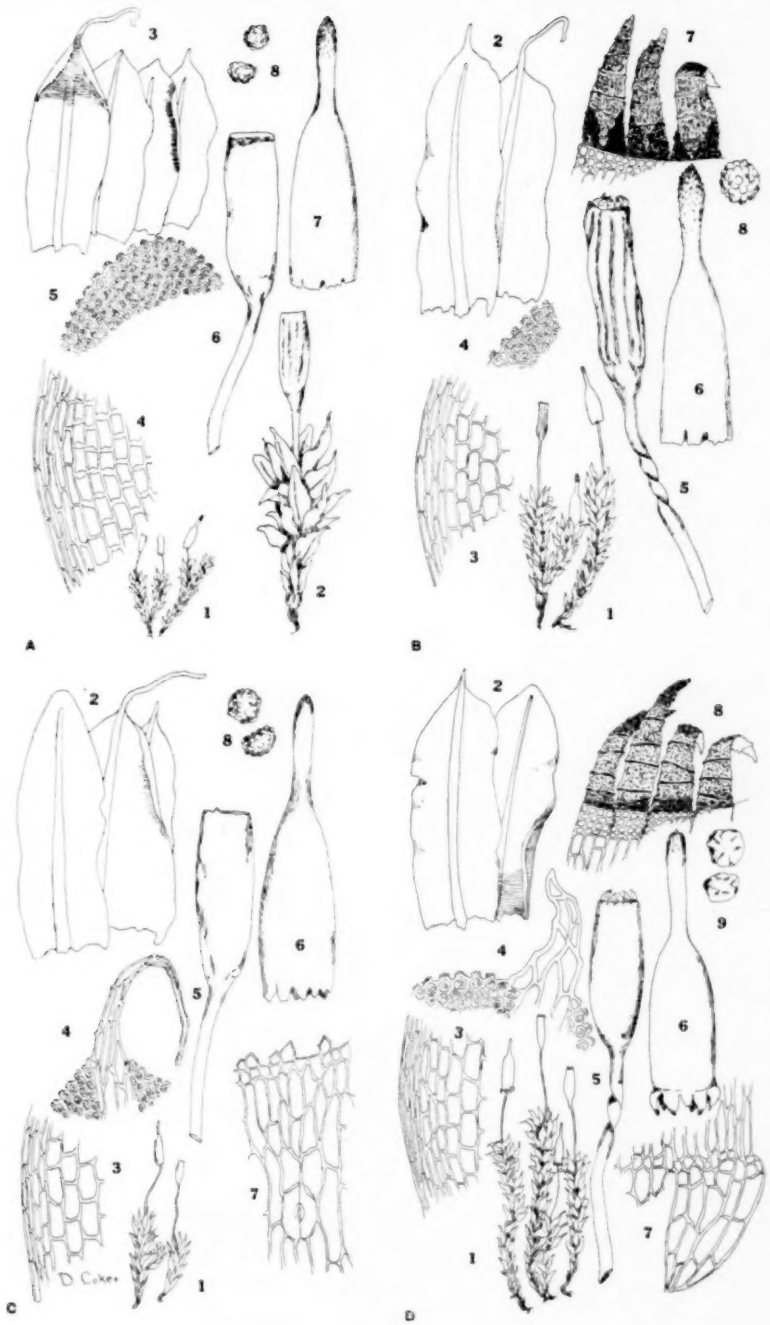
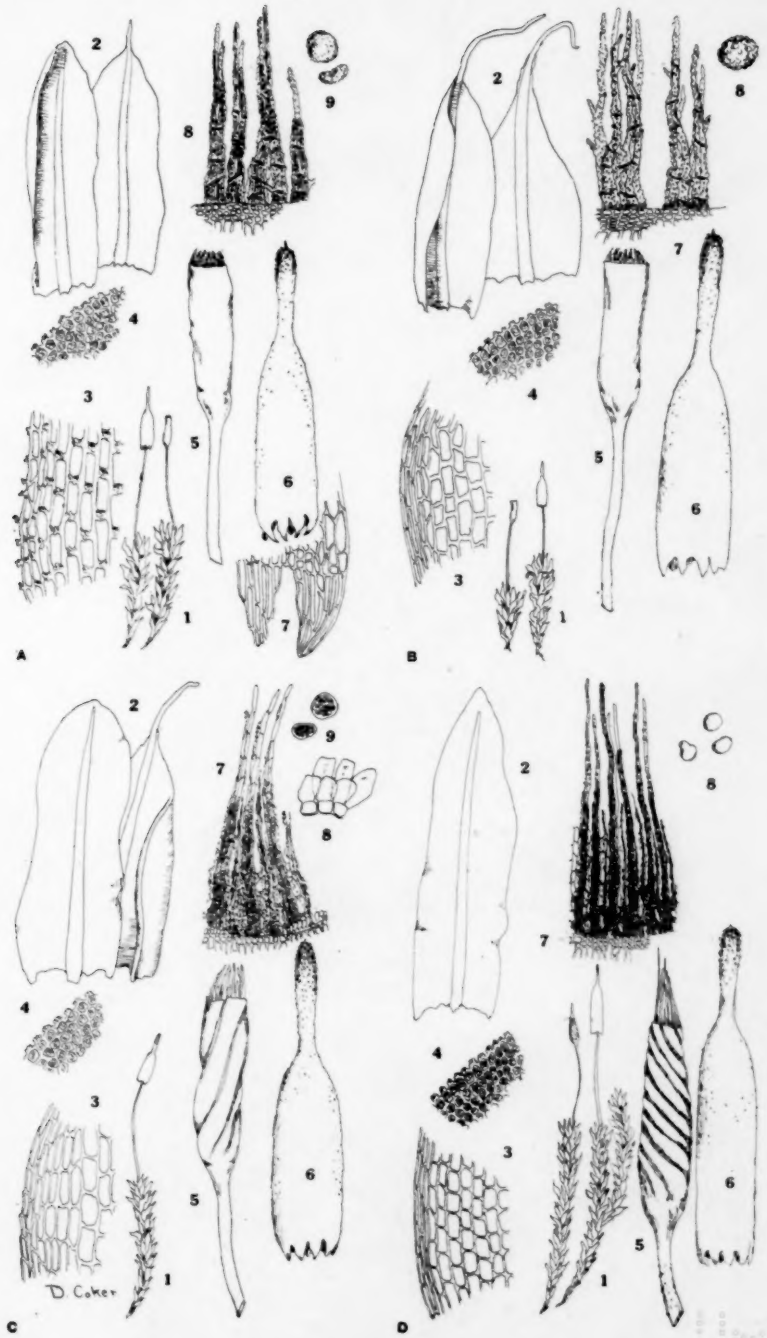


A. ENCALYPTA EXTINCTORIA (L.) SW.
B. ENCALYPTA RHABDOCARPA SCHWAEGR.
C. ENCALYPTA ALPINA SMITH
D. ENCALYPTA LACINIATA (HEDW.) LINDB.



A. ENCALYPTA APOPHYSATA NEES & HORNSCH.
P. ENCALYPTA BREVICOLLA BRUCH
C. ENCALYPTA PROCERA BRUCH
D. ENCALYPTA CONTORTA (WULF.) L NDB.

1. POLYPORUS BENGUETENSIS (MURR.) GRAFF
2. POLYSTICTUS TABACINUS VAR. BARBATUS (MURR.) GRAFF